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A NEW GENUS AND TWO NEW SPECIES OF
MADICOLOUS BEETLES FROM VENEZUELA
(COLEOPTERA: HYDROPHILIDAE)¹

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Among those beetles that have become adapted to an aquatic existence, the majority are found in typical lentic habitats, e.g., puddles, water-filled ditches, pools, ponds, and lakes. However, some beetles have become adapted to more specialized aquatic niches and belong to the madicolous faunas. Madicolous habitats may appear to be unrewarding and even unlikely places to find aquatic insects for collectors familiar with the rich variety of taxa frequently found in lentic habitats. However, minor and atypical habitats will not be overlooked if one applies the rule that aquatic insects may occur wherever water occurs. Madicoles living in streamside niches have been studied as part of complete stream surveys and are, therefore, reasonably well known. Those forms living in hygropetric habitats unassociated with streams are less well known and it is in these microhabitats where rare and new taxa often may be found. The new taxa described below were found in madicolous habitats in the mountains of northwestern Venezuela.

Hydrobiini

Notionotus new genus

Head with clypeus expanded and shelflike in front of eyes and feebly emarginate along anterior margin. Eyes viewed from above somewhat reniform. Antenna 8 segmented; 2 basal, 2 intermediates, 1 cupule and 3 club segments. Maxillary palpus short, robust, and 4 segmented; basal

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segment very short; second segment longest, as long as ultimate and penultimate combined; ultimate segment about twice as long as penultimate. Prosternum longitudinally carinate on midline, acutely angulate at apex. Prosternal process distinctly produced posteriorly, distinctly separating front coxae, apex concave for articulation with mesosternal protuberance. Elytra convex; shining; finely, sparsely punctate; narrowly margined laterally; without sutural striae; epipleura almost vertical. Mesosternum with prominent triangular protuberance on same plane as metasternum. Metasternum with apex broad between middle coxae, and merging with prominent triangular protuberance of mesosternum. Front and middle femora moderately densely punctate and pubescent beneath on basal three-fourths. Hind femur sparsely punctate and finely pubescent beneath; pubescence absent from hind margin and distal fifth.

Type of the genus: Notionotus rosalesi new species. Gender: masculine.

Etymology: Notionotus from *notios*, G.—wet, plus *notos*, G.—back; in reference to the usual condition under which these beetles have been found, i.e., creeping around on a rocky or leafy substrate beneath a thin film of slowly flowing water.

The new genus described above belongs to the tribe Hydrobiini and superficially resembles the genera *Paracymus* and *Anacaena*. However, *Notionotus* may be distinguished from both *Paracymus* and *Anacaena* immediately by the absence of a sutural stria on each elytron. In addition, *Notionotus* differs from *Paracymus* by the presence of a distinct mesosternal protuberance extending between the procoxae on the same plane as the metasternum and the absence of a median, longitudinal carina on the first abdominal sternum. *Paracymus* has a distinct longitudinal carina behind the anterior \wedge -shaped protuberance of the mesosternum and most species have a median, longitudinal carina on the first abdominal sternum. *Notionotus* also differs from *Anacaena* by the presence of a distinct prosternal carina. In d'Orchymont's (1942) key to the tribe Hydrobiini, *Notionotus* keys to the subtribe Hydrobiae. In his key to the genera in the Hydrobiae, *Notionotus* keys to couplet 16 because it lacks a sutural stria, has eight segments in the antenna, the eyes viewed from above are somewhat reniform and the maxillary palpi are short and robust. From *Oocyclus* and *Beralitra*, which d'Orchymont separated in couplet 16, the new genus may be distinguished readily by the following couplets.²

1. Apex of metasternum broad between middle coxae and extending on the same plane onto the prominent triangular protuberance of the mesosternum; elytra shining and with a few fine, widely spaced punctures on surface; length 1.73–1.97 mm;

² Couplets modified from d'Orchymont's (1942) key.

South America *Notionotus* Spangler
 Apex of metasternum very narrow between middle coxae, almost
 laminate, then meeting the elliptical or ovoid protuberance of
 mesosternum; elytra shining or not, but with numerous coarse
 punctures and frequently with tufts of golden setae spaced
 regularly along striae or serial rows of punctures; length
 2.95-6.52 mm

2. Elytral suture not raised posteriorly; form more or less hemi-
 spherical; eyes seen from above approaching each other pos-
 teriorly; Central and South America, Ceylon, and Sumatra
 *Oocyclus* Sharp

Elytral suture raised posteriorly; form depressed with the elytra
 more or less dilate-explanate on the sides; elytral epipleura
 horizontal posteriorly, developed to the sutural angle; South
 America *Beralitra* d'Orchymont

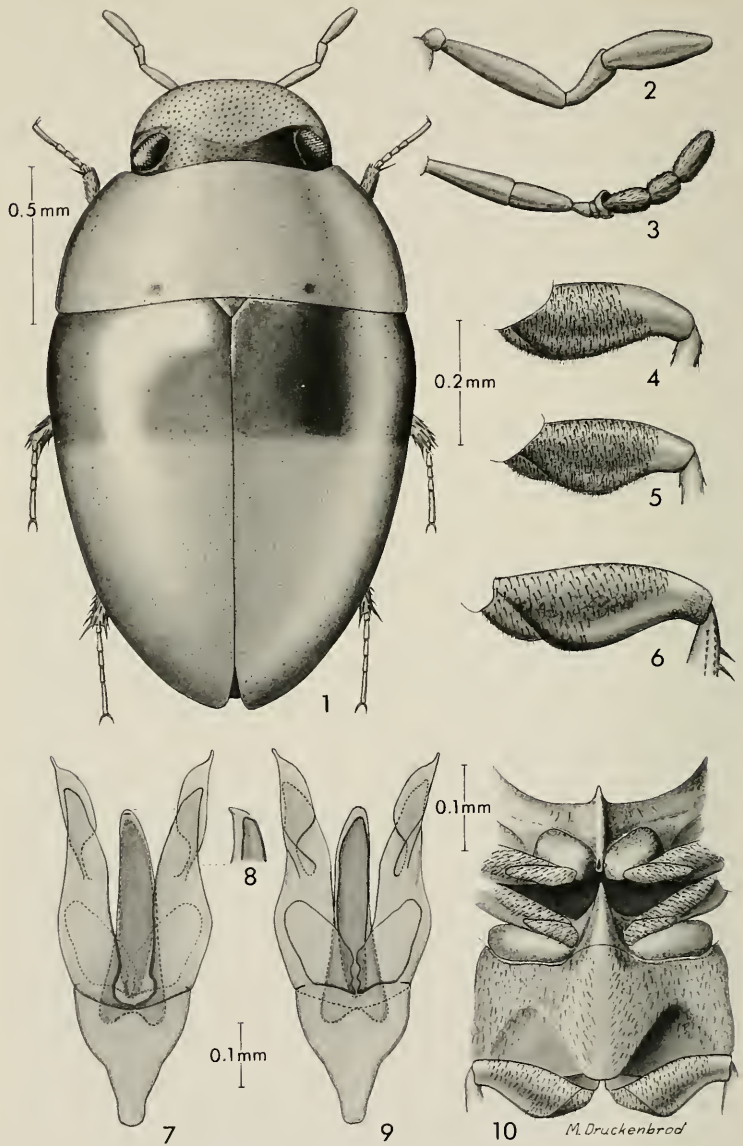
Notionotus rosalesi new species

Figures 1-10

Holotype male: Length 1.92 mm, greatest width 1.10 mm at mid-
 length. Color of head mostly testaceous, reddish brown medially and
 along basal margin of head. Pronotum testaceous except two small
 black spots along hind margin and separated about one-third the width
 of hind margin. Scutellum testaceous. Elytra testaceous except a dark
 reddish-brown band across basal third. Mouthparts, antennae, and legs
 mostly testaceous; underside of head darker reddish brown; prosternum
 testaceous but carina darker; mesosternum and anterior half of meta-
 sternum dark reddish brown; posterior half of metasternum testaceous.
 Abdominal sterna dark reddish brown.

Head shining; with fine, widely spaced punctures over surface, punc-
 tures separated by about 5 times their width. Clypeus greatly expanded
 and shelflike in front of eyes, covering much of labrum; finely alutaceous
 along anterior margin. Labrum finely alutaceous over entire surface and
 shallowly emarginate medially. Ventral surface of head finely alutaceous
 behind eyes and in gular region; mentum smooth except for fine, sparse
 punctures. Antenna 8 segmented; 2 basals, 2 intermediates, 1 cupule
 and 3 club segments; club segments darkest. Maxillary palpus 4 seg-
 mented; basal segment very short; second segment longest, almost as
 long as ultimate and penultimate segments combined; ultimate segment
 about twice as long as penultimate segment. Labial palpus small; 3
 segmented; first segment short, about half as long as second segment;
 second segment about two-thirds as long as ultimate segment, with 1 long
 yellow seta on apicodorsal angle; ultimate segment broadest, swollen
 dorsoventrally, with 1 long yellow seta at apicoventral angle.

Pronotum almost 3 times as wide as long; punctures finer than on
 head and very sparse; narrowly margined laterally; anterolateral and
 posterolateral angles rounded. Prosternum longitudinally carinate on



FIGS. 1-10. *Notionotus rosalesi* new genus, new species, ♂ holotype: 1. habitus, dv; 2. maxillary palpus, vv; 3. antenna, vv; 4. profemur, vv; 5. mesofemur, vv; 6. metafemur, vv; 7. genitalia, dv; 8. median lobe

midline, acutely angulate at apex. Prosternal process distinctly produced posteriorly, distinctly separating front coxae; apex concave for articulation with mesosternal protuberance.

Elytra convex, narrowly margined laterally; widest slightly before midlength; surface with very fine, sparse punctures similar to pronotum. Sutural stria absent. Scutellum a small equal-sided triangle. Epipleura almost vertical.

Mesosternum finely alutaceous, with prominent triangular postero-medial protuberance on same plane as metasternum. Metasternum smooth and impunctate on swollen medial region but finely alutaceous laterally; apex broad between middle coxae and extending on same plane onto the prominent triangular protuberance of mesosternum. Abdominal sterna finely alutaceous and moderately densely covered with short yellowish pubescence.

Front and middle legs with femora finely, densely punctate and densely pubescent on basal four-fifths. Hind femur smooth except for fine, sparse, seta-bearing punctures on basal four-fifths (Fig. 6); apical fifth finely alutaceous. Trochanter densely pubescent. Tarsal formula 5-5-5. Foreleg with segments 1 to 4 about equal in length; fifth segment about as long as segments 1 to 4 combined. Midleg with first, second, and third segments subequal; fourth segment shortest, about one-third as long as fifth segment; fifth segment slightly shorter than second, third, and fourth segments combined. Hindleg with basal segment short, about as long as fourth segment; second and third segments about equal in length; fourth segment slightly less than half as long as fifth segment; fifth segment about as long as third and fourth segments combined.

Genitalia as illustrated (Figs. 7, 8, 9).

Allotype: Similar to male except mentum slightly less punctate.

Variations: The specimens vary in size as follows. Male: length, 1.73 to 1.92 mm (avg. 1.82 mm); width, 1.80 to 2.00 mm (avg. 1.60 mm). Female: length, 1.73 to 1.97 mm (avg. 1.82 mm); width, 1.80 to 2.05 mm (avg. 1.88 mm). In addition to size difference, four specimens have a row of fine, indistinct punctures near suture. On two other specimens these punctures are coarse and distinct.

Type-data: Holotype male, Venezuela: Aragua: Rancho Grande (10 km S), 14 February 1969, Paul and Phyllis Spangler. USNM Type 71950, deposited in the National Museum of Natural History, Smithsonian Institution. Allotype, same data as holotype. Paratypes: same data as holotype, 2 ♀♀. Aragua: Rancho Grande, (15 km N), 20 February 1969, 1 ♂. Barinas: Barinitas, (24 km NW), 23 February 1969. All specimens were collected by Paul and Phyllis Spangler.

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apex, lv; 9. genitalia, vv; 10. pro-, meso-, metasterna, vv. (vv = ventral view; dv = dorsal view; lv = lateral view.)

Etymology: I take great pleasure in dedicating this new species to my friend Dr. Carlos J. Rosales, professor at the Universidad Central, Maracay, Venezuela. Dr. Rosales and his associates kindly arranged for us to use the facilities at Rancho Grande where we found the new genus and species described above. He also led us on a delightful 5-day field excursion to the state of Barinas where we found the second new species described below.

Habitat: The type-specimens were found in a small spring brook 10 km south of Rancho Grande at approximately 1,300 feet elevation. Specimens were collected from a small pool on the north side of and adjacent to Highway 3. The pool was in bedrock and the bottom was covered with rotting leaves. The paratype from 15 km north of Rancho Grande was found below a small dam built across a spring brook also at approximately 1,300 feet elevation. This specimen was found beneath leaves in a seepage area below the dam. The paratype from 24 km northwest of Barinitas was found beneath a leaf in water seeping over a rock outcrop exposed by a road cut.

Notionotus liparus new species

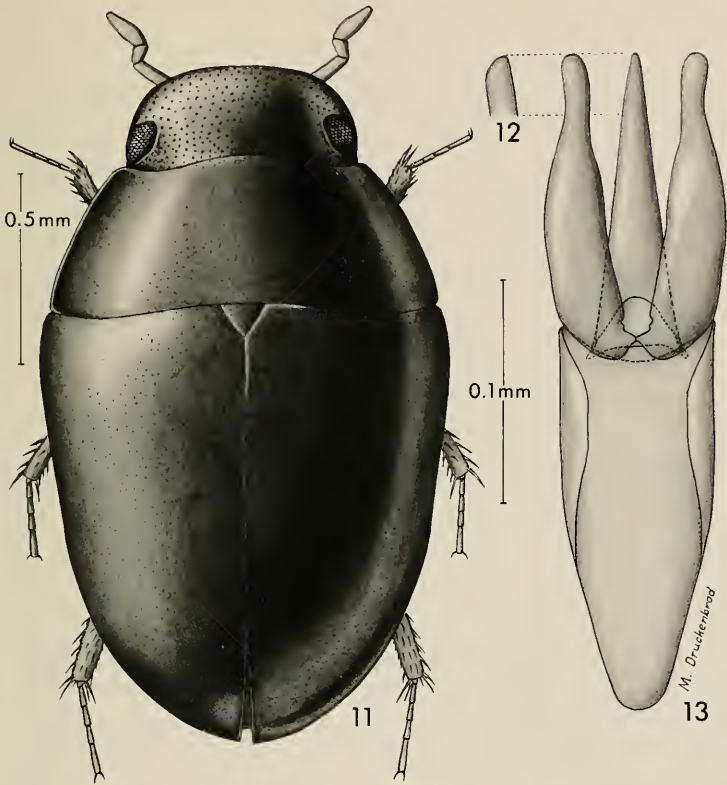
Figures 11, 12, 13

Notionotus liparus may be distinguished from *N. rosalesi* immediately by its piceous color (Fig. 11), and distinctively different genitalia (Fig. 13).

Holotype male: Length 1.65 mm, greatest width 1.00 mm at mid-length. Color above piceous except lateral and anterior margins of pronotum and sides of elytra dark reddish brown. Ventral surface of head, mouthparts, prosternum, epipleura, and legs reddish brown. Mesosternum, metasternum, and abdominal sterna piceous.

Head shining, with fine punctures separated by about 2 times their width. Clypeus greatly expanded and shelflike in front of eyes, covering much of labrum; feebly emarginate along anterior margin. Labrum smooth except for a few fine punctures; shallowly emarginate medially. Ventral surface of head finely alutaceous behind eyes and in gular region; mentum smooth except for a few coarse punctures. Antenna 8 segmented; 2 basals, 2 intermediates, 1 cupule, and 3 club segments. Maxillary palpus 4 segmented; basal segment very short; second segment longest, about three-fourths as long as third and fourth segments combined; penultimate segment angulate basally and swollen apically; ultimate segment almost twice as long as penultimate segment and swollen. Labial palpus small; 3 segmented; first segment short, about half as long as second segment; second segment about two-thirds as long as ultimate segment, with 1 long yellow seta on apicodorsal angle; ultimate segment broadest, compressed laterally, swollen dorsoventrally, with 1 long yellow seta at apicoventral angle.

Pronotum about 3 times as wide as long; punctures finer than on head and very sparse; narrowly margined laterally; anterolateral and postero-



FIGS. 11-13. *Notionotus liparus* new species, ♂ holotype: 11. habitus, dv; 12. median lobe apex, lv; 13. genitalia, dv. (dv = dorsal view; lv = lateral view.)

lateral angles rounded. Prosternum longitudinally carinate on midline, acutely angulate at apex. Prosternal process distinctly produced posteriorly, distinctly separating front coxae, apex concave for articulation with mesosternal protuberance.

Elytra convex, narrowly margined laterally; widest slightly before midlength; surface with very fine, sparse punctures similar to pronotum. Sutural stria absent. Scutellum a small equal-sided triangle. Epipleura almost vertical.

Mesosternum finely alutaceous, with prominent triangular postero-medial protuberance. Metasternum smooth and impunctate on swollen medial region but finely alutaceous laterally; apex broad between middle coxae then narrowing and extending on same plane onto the promi-

ment triangular protuberance of mesosternum. Abdominal sterna finely alutaceous and moderately densely covered with short yellowish pubescence.

Front and middle legs with femora finely, densely punctate and densely pubescent on basal four-fifths. Hind femur smooth except for fine, very sparse, seta-bearing punctures on basal four-fifths, apical fifth alutaceous; seta-bearing punctures denser alongside pubescent trochanter. Tarsal formula 5-5-5. Foreleg with segments 1 to 4 about equal in length; last segment about as long as segments 1 to 4 combined. Midleg with first, second, and third segments subequal; fourth segment shortest, about one-third as long as fifth segment; fifth segment slightly shorter than second, third, and fourth segments combined. Hindleg with basal segment short, about as long as fourth segment; second and third segments about equal in length; fourth segment slightly less than half as long as last segment; last segment about as long as third and fourth segments combined.

Genitalia as illustrated (Figs. 12, 13).

Allotype: Similar to male except mentum is more sparsely punctate.

Variations: The specimens vary in size as follows. Male: length, 1.65 to 1.90 mm (avg. 1.76 mm); width, 0.90 to 1.15 mm (avg. 1.05 mm). Female: length, 1.80 to 1.85 mm (avg. 1.82 mm); width, 1.05 to 1.15 mm (avg. 1.11 mm).

Type-data: Holotype male, Venezuela: Barinas: Barinitas (24 km NW), 23 February 1969, Paul and Phyllis Spangler. USNM Type 71951, deposited in the National Museum of Natural History, Smithsonian Institution. Allotype, same data as holotype. Paratypes: same data as holotype, 3 ♂♂, 2 ♀♀. Merida: Santo Domingo (12 km SE), 24 February 1969, 10 ♂♂, 4 ♀♀. All specimens were collected by Paul and Phyllis Spangler.

Etymology: *liparus* from liparos, G.—shiny; in reference to the shiny appearance of the beetle.

Habitat: These specimens, like *N. rosalesi*, are madicoles and were found on the wet surface of rocks, in crevices, and on leaves in spring seepage areas in road cuts. The specimens from 24 km northwest of Barinitas were collected at approximately 2,000 feet. The specimens from 12 km southeast of Santo Domingo were found at approximately 6,000 feet beside a roadside shrine.

LITERATURE CITED

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